## DALI/DSI Master Module



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@ EN 60079-0, -15

EN 61241-0, -1

The DALI standard (IEC 60929), a protocol across all manufacturers, ensures the interoperability of electronic ballasts in lighting applications. This new standard is substitute for the 1-10V dimmer interface.

The DALI/DSI Master for the WAGO-I/O SYSTEM 750 is a 12mm wide I/O module that fits all controllers of the 750 series. A DALI Master can control up to 64 slaves. Each slave can be assigned to 16 individual

Any combinations of DALI controls with other groups are possible with the WAGO-I/O-SYSTEM 750. Several DALI Masters can be connected to a single fieldbus

node. The maximum number of modules within a controller depends on the memory

requirements of the application. The WAGO-1/O-PRO 32 software is used to program the fieldbus nodes. WAGO supports simple application programming with pre-programmed function blocks for DALI.

Description		Item No.	Pack. Unit
DALI/DSI Master	Module	750-641	1
Accessories		Item No.	Pack. Unit
Miniature WSB C	Juick marking syste	em	
(Transmission and )	plain	248-501	5
Englishment	with marking	see pages 352 353	
SHELLING TO			
Approvals		Also see "Approvals Overview	" in Section 1
Conformity marking	g	CE	
Shipbuilding		ABS, DNV, GL, KR	
(@)∞ UL 508			
-® ANSI/ISA 12.	12.01	Class I, Div. 2, Grp. ABCD, T4	

I M2 / II 3 GD Ex nA IIC T4

The DC/DC converter 288-895 is required to supply the DALI Master. The DC/DC converter delivers up to 400mA and can supply 3 DALI lines each with up to 130mA (see also "DALI/DSI Master Module"\* manual in section 1.1.1.7.3 "DALI Bus Line").

DSI is a proprietary interface which was developed by the TRIDONIC ATCO company. As with DALI, electronic ballasts can be digitally controlled by the DSI. However, compared to DALI, the slaves of the DSI module cannot be addressed individually and no feedback signals can be sent to the master. The maximum number of slaves controlled by the module is limited to 100 perticipants per line (100 participants \* 2 mA = 200 mA). Just as for DALI, the DC/DC converter 288-895 is required to supply the DSI.

Technical Data	
DALI specification	DIN IEC 60929 (VDE 0712 Part 23)
	Only in conjunction with 288-895 DC/DC
	Converter
DSI specification	TRIDONIC ATCO SPECIFICATION 2.0
Number of slaves (DALI)	64
Number of slaves (DSI)	100
Max. current output (DALI/DSI)	200 mA
Voltage supply (DALI/DSI)	18 V via 288-895 DC/DC Converter
Transmission channel	1
Current consumption (internal)	30 mA
Power supply	via internal system supply
Isolation	1500 V DC DALI-bus/K-bus
Internal bit width	1 byte control/status, 5 byte data
Wire connection	CAGE CLAMP®
Cross sections	0.08 mm <sup>2</sup> 2.5 mm <sup>2</sup> / AWG 28 14
Stripped lengths	8 9 mm / 0.33 in
Width	12 mm
Weight	52.2 g
EMC: $\mathbf{C}\mathbf{\epsilon}$ - immunity to interference	acc. to EN 61000-6-2 (2005) *
EMC: $CE$ - emission of interference	acc. to EN 61000-6-3 (2007) *
	* Only in conjunction with 288-895 DC/
	DC Converter
EMC: marine applications	
- immunity to interference	acc. to Germanischer Lloyd (2003)
EMC: marine applications	
- emission of interference	acc. to Germanischer Lloyd (2003)



# 753-647 DALI Multi-Master Module





The 753-647 DALI Multi-Master Module complies with DALI standard according to IEC 62386. This manufacturer-independent protocol ensures interoperability of DALI devices in lighting applications.

The 1/2 inch (12 mm) wide module is a DALI interface used in combination with WAGO 750 Series Controllers and Modules (e.g., BACnet, KNX, EnOcean, LON, MODBUS). Each DALI Multi-Master Module supports 64 addresses for electronic control gears (ECGs) and 64 addresses for DALI sensors. Each DALI ECG can be assigned to 16 groups and 16 scenes. The 753-647 Module also offers 16 additional virtual groups on the DALI bus.

Using the WAGO-I/O-SYSTEM, DALI control devices are seamlessly integrated with all supported BA and fieldbus protocols. Several DALI masters can be connected to a single fieldbus node. The maximum number of modules that can be connected to a controller depends on the memory required by the application. Fieldbus nodes are programmed via WAGO-I/O-PRO software. WAGO provides a comprehensive IEC-61131-3 library of function blocks, simplifying the creation of complex lighting applications.

Pack. Description Item No. Unit **DALI Multi-Master Module** 753-647 Pack. Accessories Item No. Unit DALI Configurator see page 33 or download: www.wago.com WAGO-I/O-CHECK, RS-232 kit 759-302 Miniature WSB Quick marking system 248-501 plain 5 see Full Line Catalog AUTOMATION with marking 2012/2013 **753 Series Connectors** 753-110 25 **Coding fingers** 753-150 100 753 Series pluggable connectors and coding fingers are included. Approvals Conformity marking ce ® UL 508 ₪ pending Image: Image pending EN 61241-0, -1

Alternatively an "Easy Mode" allows lighting functions to be easily controlled without any complicated PLC programming. The 753-647 Module is future-proof and upgradable to the latest DALI release. A comprehensive and easy-to-use commissioning and maintenance tool is available as stand-alone application or as integrated WAGO-I/O-CHECK software component.

The two following power supply options are available for the 753-647 Series: 1. The 753-620 DALI Multi-Master DC/DC Converter is used to supply one single module.

2. The 787-1007 Power Supply is used to supply several modules.

753-647

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Technical Data	
DALI specification	DIN IEC 62386 only in conjunction with
	753-620 or 787-1007 Power Supplies
Number of slaves (DALI)	addressable:
	64 control devices + 64 control gears
Module power supply at +V and -V	18 V via 753-620 / 787-1007 Power
	Supplies
Transmission channel	1
Technical information acc. to DALI specifica	tion
Maximum supply current	250 mA
Guaranteed supply current	200 mA
Current consumption (internal)	30 mA
Power supply	via system voltage (DC/DC)
Isolation	1500 V DC DALI bus/Internal data bus
Internal bit width	24-byte data
Commissioning	via WAGO-I/O-CHECK
Configuration	with WAGO DALI Configurator
Programming	via WAGO-I/O-PRO
Wire connection	CAGE CLAMP®
Cross sections	0.08 mm <sup>2</sup> 2.5 mm <sup>2</sup> / AWG 28 14
Stripped lengths	9 10 mm / 0.37 in
Width	12 mm
Weight	55 g
EMC: $CE$ - immunity to interference	acc. to EN 61000-6-2 (2005) *
EMC: $CE$ - emission of interference	acc. to EN 61000-6-3 (2007) *
	* Only in conjunction with 753-620 /
	787-1007 DC/DC Converter
EMC: marine applications	
- immunity to interference	acc. to Germanischer Lloyd (2003)
EMC: marine applications	
- emission of interference	acc. to Germanischer Lloyd (2003)

### **DALI** Configurator

The DALI Configurator allows easy commissioning of a DALI network via 753-647 DALI Multi-Master Module. The configurator is available as stand-alone Windows application or for use with WAGO-I/O-CHECK software. It provides the following functions: easy commissioning, configuration, service, support and maintenance of a DALI network. Comprehensive backup & restore features, as well as offline configuration option for the entire DALI network (including ECGs and sensors) are available.

Features:

- Stand-alone software or for use with WAGO-I/O-CHECK
- Commissioning functions:
  - Addressing
  - Formation of scenes and groups
  - Control gear configuration
  - Offline configuration option
- Service, support and maintenance functions:
  - Backup & restore
  - Status messages from defective ECGs/lamps
  - Identification of double addresses
  - Operating hours display
- Windows-conform user interface:
  - Multiple selection for time-optimized configuration
  - Displays network in a clear tree structure
  - Supports different commissioning workflows

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DALI Configurator is available as part of WAGO-I/O-CHECK (Version 3.4.1.9 and higher) or as a stand-alone application (www.wago.com).

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# DALI Multi-Master DC/DC Converter

753-620



Part of the WAGO-I/O-SYSTEM, the 753-620 DALI Multi-Master DC/DC Converter is just ½ inch (12mm) wide. It supplies power to the 753-647 DALI Multi-Master Module and delivers maximum 200mA current to operate a single DALI line. The maximum number of slaves depends on the total power consumption of the single DALI devices.

consumption of the single DALI devices. The 753-620 DC/DC Converter is supplied via 24V power jumper contacts. Cable bridges connect the DC/DC Converter to the DALI Multi-Master Module.

Description		Item No.	Pack. Unit
DALI Multi-Maste	er DC/DC Converter	753-620	1
Accessories		Item No.	Pack. Unit
	Miniature WSB Quid	k marking system	
Letter	plain	248-501	5
CALL OF THE PARTY OF	with marking	see Full Line Catalo	g AUTOMATION
		2012/2013	
753 Series Conne	ectors	753-110	25
Coding fingers		753-150	100
753 Series plugga	ble connectors and coding	fingers are included.	

Technical Data	
Voltage via power jumper contacts (max.)	24 VDC
Input voltage range	18 31.2 VDC
Current via power jumper contacts (max.)	10 ADC
Output voltage	18 VDC (at +V and -V)
Nominal output current	200 mA
Short circuit protection	permanent
Test voltage input / output	1.5 kV eff.
Wire connection	CAGE CLAMP®
Cross sections	0.08 mm <sup>2</sup> 2.5 mm <sup>2</sup> / AWG 28 14
Stripped lengths	9 10 mm / 0.37 in
Width	12 mm
Weight	55 g

# 787-1007

## **Power Supply**

for 753-647 DALI Multi-Master Module



The 787-1007 Primary Switch Mode Power Supply is specially designed to supply the 753-647 DALI Multi-Master Module. The 787-1007 features a 54mm-wide DIN-rail mount enclosure with input voltage range of 85 to 264VAC (120 - 373VAC). The power supply provides an output voltage of 18VDC and a maximum output current of 1100mA – enough to supply up to five parallel modules. The maximum current per DALI line is limited to 200mA in each DALI Multi-Master Module. • Supplies up to five 753-647 DALI Multi-Master Modules\*

- Prepared for class II equipment
- Natural convection cooling when horizontally mounted
  Stage profile, ideal for distribution boards or distribution boxes

Technical Data	
Input:	
Nominal input voltage Vi nom	100 240 VAC
Input voltage range	85 264 VAC; 120 373 VDC
Frequency	44 66 Hz; 0 Hz
Input current li	0.6 A at 110 VAC / 0.4 A at 230 VAC
Inrush current	< 30 A, NTC
Mains failure hold-up time	> 10 ms at 110 VAC /
	> 80 ms at 230 VAC
Output:	
Nominal output voltage Vo nom	18 VDC
Output current lo	1.1 A at 18 VDC
	max. 0.8 A (18 VDC) in any mounting
	position
Factory preset	18 VDC
Adjustment accuracy	2 %
Residual ripple	< 150 mV (peak-peak)
Current limitation	1.1 x lo typ.
Overload behavior	Constant current
Operational indication	LED green (Va)
Efficiency / power losses:	
Efficiency	80 % typ.
Power loss P <sub>v</sub>	3 W (no load) /
	6 W (rated load)
Fuse protection:	
Internal fuse	2 AT
External fuse	Wire breaking 10 A, 16 A,
	Characteristic B, C
	An external DC fuse is required for the DC
	input voltage
* Note: The 787-1007 Power Supply mu	st be operated in a DALI network with
interconnected 753-647 DALI Multi-Maste	r Module. Otherwise the connected DALI
devices will be destroyed.	



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Description	Item No.	Pack. Unit
Primary Switch Mode Power Supply,	787-1007	1
18 VDC / 1.1A		
Technical Data		
Environmental requirements:		
Ambient operating temperature	-25 °C +55 °C	
Storage temperature	-25 °C +80 °C	
Rel. humidity	30 % 85 % (no condensa	tion)
Degree of pollution	2 (acc. to EN 50178)	
Climatic category	3K3 (acc. to EN 60721)	
Safety and protection:		
Enclosure	Plastic, light gray,	
	Flammability class VO acc. to	0 UL94
Test voltage pri sec.	4.2 kV DC	
Protection class	Prepared for class II equipme	ent
Degree of protection	IP20 (acc. to EN 60529)	
No-load proof	yes	
Feedback voltage	max. 20 VDC	
Short circuit protection	yes	
MTBF	500000 h	
Connection and type of mounting:		
Wire connection	Input/Output: WAGO Series	s 740
Cross sections	Input/Output:	
	0.08 mm <sup>2</sup> 2.5 mm <sup>2</sup> / AW	G 28 12
Stripped lengths	Input/Output: 6 7 mm / 0	.24 0.28 in
Type of mounting	DIN-rail mount (EN 60715)	
Dimensions and weight:		
Dimensions (mm) W x H x L	54 x 89 x 59	
	Length: 55 mm, from upper-e	edge
	of DIN 35 rail	
Weight	170 g	
Standards and approvals:		
Standards/Specifications	EN 60950 (SELV), EN 6120	04-3,
	GL (Environmental Category	A, EMC 2),
	UL 60950**, UL 508** (**	* pending)



W/AGO

## **DALI Multi-Sensors**

**AUTOMATION** 



Ceiling Installation





**Box Installation** 





Surface Mounting



The WAGO DALI MSensor 02 is used with WAGO DALI Modules (753-647 DALI Multi-Master Module or 750-641 DALI/DSI Module). It has been designed for the following principal applications: - Individual offices - Open-plan offices

Training/presentation rooms
Corridors, passageways and garages

The Multi-Sensor features both motion and light detection. As an option, the sensor can be operated via remote control (from Tridonic). The sensor enables both motion detection and daylight-dependent lighting control; both of which can also be deactivated.

Addressing is performed via rotary switch or WAGO DALI Configurator. Parameters can be adjusted individually via WAGO DALI Configurator. Power supply is provided via DALI line.

The number of sensors, which can be operated on a DALI line, depends on the total power consumption of the specific devices and address range for the actuators and sensors. Due to the capacity of the DALI bus, a maximum of 16 DALI sensor couplers must be operated on the DALI Multi-Master Module (753-647).

Installation notes:

- The DALI MSensor 02 is supplied directly via DALI line.
- DALI is not SELV (Safety Extra Low Voltage). The installation instructions for mains voltage therefore apply.
- The detection range of the sensor must be within the lighting area of the controlled luminaires
- The detection ranges of the sensors must not overlap as this may influence the lighting control.
- When installed at a height other than the recommended installation height (2.5 m), the presence and light sensor might show different characteristics. When mounted at a higher level, its sensitivity is reduced. If mounted at a lower level, its range is diminished.
- Heaters, fans, printers and copiers located in the detection range may cause incorrect presence detection.

Description	DALI MSensor 02 5DPI 41rc (Ceiling Installation)	DALI MSensor 02 5DPI 41w (Box Installation)	DALI MSensor 02 5DPI 41rs (Surface Mounting)
Item Number	2851-8301	2851-8302	2851-8303
Technical Data			
Ø of detection range, mounted at a height of 2.5 m		5 m	
Extension of the detection range	2 m (if mounted at a height of 2.5 m	2 m (if mounted at a height of 2.5 m	-
	and swivelled through 15°)	and swivelled through 15°)	
Swivel design	yes	yes	no
Swivel range	± 15°	± 15°	0°
Detection angle		360°	
Light measurement at the sensor head	10 650 lx (The measured value at th	e sensor head corresponds to approx. 15	5 to 2,000 lux on the surface measured.)
Remote control range		5 m	

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Technical Data			
Power supply	via DALI line		
Current consumption	6 mA from DALI line		
Operating temperature	0 °C +50 °C		
Storage temperature	-25 °C +55 °C		
Degree of protection	IP20		
Wire type and cross-section	Solid or fine-stranded wires ranging from		
	0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> (AWG 20-16)		

Technical Data	
General settings:	
Motion detection	enabled, on/off
Lighting control	enabled
Setpoint, lighting control	150 lx
Power-on setting	no action
Bright-out timeout	10 min.
Bright-out threshold	150 %
Control speed	4
Switch-on value	auto (calculated)
Rotary switch	0, broadcast
Motion detector settings:	
Fade-in time	< 0.7 s
Presence value	regulated
Run-on time	20 min.
Fade time	5.6 s
Absence value	3 %
Switch-off delay	10 min.
Fade-off time	5.6 s
Manual-off	10 min.

### Light detection



h *	d1	d2
1,7 m	2,4 m	3,4 m
2,0 m	2,8 m	4,0 m
2,3 m	3,2 m	4,6 m
2,5 m	3,5 m	5,0 m
2,7 m	3,8 m	5,4 m
3,0 m	4,2 m	6,0 m
3,5 m	4,9 m	7,0 m
4,0 m	5,6 m	8,0 m

d2 -

\* The recommended maximum room height for office applications is 3 m and for corridor applications 4 m, for example.

Calculation of the diameter: d = 2 x tan (0.5 x  $\alpha$ ) x h

### Motion detection





# WAGO DALI Multi-Sensor Kit





ECO CI Kit

The WAGO DALI Multi-Sensor Kit is paired with the WAGO 753-647 DALI Multi-Master Module and includes the following three components:

- DALI Sensor Coupler (also available individually)

DALI Sensor Coupler

- ECO CI Kit

- MULTI 3 CI Sensor

The DALI Sensor Coupler connects the MULTI 3 CI Sensor to a DALI bus system. For this, the MULTI 3 CI Sensor is connected to the DALI Sensor Coupler via RJ-10 socket. DALI terminals connect the DALI Sensor Coupler to both the DALI network and WAGO DALI Module. The ECO CI Kit contains two covers, which can be used as touch guards and strain relief for cables within the ceiling installation of the DALI Sensor Coupler.

The MULTI 3 CI Sensor has a motion and light sensor, enabling both motion detection and daylight-dependent lighting control. Power supply to the DALI Sensor Coupler is provided via DALI line. The DALI Sensor Coupler transmits measured values from the connected sensor channels as telegrams to the WAGO DALI Module via DALI line. Parameters can be adjusted individually via WAGO DALI Configurator.

The number of sensors, which can be operated on a DALI line, depends on the total power consumption of the specific devices and the address range for the actuators and sensors. Due to the capacity of the DALI bus, a maximum of 16 DALI sensor couplers must be operated on the DALI Multi-Master Module (753-647).

Description	Item No.	Pack. Unit
WAGO DALI Multi-Sensor Kit	2851-8201	1
DALI Sensor Coupler	2851-8202	1
Approvals		
Conformity mark	CE	
,		

### Assembly

#### Sensor connection

The MULTI 3 CI Sensor is connected to a 4-pole RJ-10 socket (4P4C), which is marked as "Sensor" on the housing cover.

For easy connection, the sensor plug is equipped with a quick-connect latch. Only one MULTI 3 CI Sensor must be connected to sensor coupler.

#### Ceiling installation

For installation outside of a lighting fixture (e.g., suspended ceiling), the ECO CI Kit must also be attached to both sides of the unit to ensure strain relief and touch protection. The DALI Sensor Coupler can also be installed in lighting fixtures. The installation spaces available in lighting fixtures can be used, as the dimensions correspond to those of an electronic ballast.

#### Note:

The DALI Sensor Coupler is also available individually, allowing the unit to be combined with other multi-sensor models from Osram.

Technical Data	
DALI Sensor Coupler	
Power supply	via DALI line
Current consumption	5 mA (from the DALI line)
Input signal voltage/current:	according to MULTI 3 CI Sensor
Operating temperature	0 °C +50 °C
Connections	Inputs: for MULTI 3 CI Sensor's modular plug 4P4C (RJ-10),
	sensor cable length, max. 5 m
	DALI connection:
	Push-wire connectors, 8.5 – 9.5 mm strip length
Cross sections	0.5 - 1.5 mm² (s + f-st) / AWG 20 - 16
Dimensions (mm) W x H x D	118 x 21 x 30
Weight	35 g
Storage temperature	-25 °C +70 °C
Relative humidity (non-condensing)	5 - 93 %
Degree of protection	IP20
ECO CI Kit	
Installation opening diameter	42 - 48 mm
Minimum suspended ceiling distance	25 mm
MULTI 3 CI Sensor	
Maximum total length of signal line	
(incl. all connections to the control	
units)	100 m
Dimensions (Diameter x H)	50 x 25 mm
Light sensor detection area	20 – 600 lx (measured on the sensor),
	opening angle approx. 90°
Recommended installation height	2 – 4 m
Motion detection area	Conical, opening angle approx. 80°,
	depending on installation height 4 – 8 m

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